

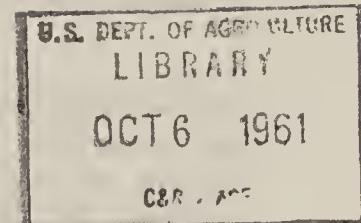
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UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Electrification Administration  
Telephone Engineering Division



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Issue No. 14

Telephone Engineering Newsletter

Newsletters are intended to provide a means of answering questions that arise in the field and to advise the field of new developments. They are not intended to be instructions nor to replace in any respect the presently approved channels for establishing requirements and procedures. Suggestions for news items will be appreciated.

Telephone Staking School

Staking schools similar to those that have been held in the past are scheduled for December 4, 5 and 6, 1956, at Hutchinson, Kansas, and January 8, 9 and 10, 1957, in Minneapolis, Minnesota, for engineers working in those areas.

Line Noise Caused by Central Office Equipment Unbalances

Unbalances in central office equipment have been found to contribute to subscriber line noise. Noisy lines should be checked in accordance with the recommendations given in Section 455 of the TE & CM. It is important to check on reverting calls in addition to ordinary calls in offices which provide talking battery through the line circuit on reverting calls.

TE & CM Sections Soon to be Issued

The following TE & CM sections have been submitted for reproduction:

- Rev. 206 Numbering Plans
- Rev. 210 Telephone System Design Criteria, Engineering Time Periods
- New 221 Assignment of Line and Station Numbers (TPS)
- Rev. 325 Application Guide for Preparation of Detail Central Office Equipment Requirements
- Rev. 406 Attenuation Data
- Rev. 615 Design of Open Wire Lines
- Rev. 625 Open Wire Pole Top Assembly Units

Installation of Buried Wire, Girard, Kansas

REA provided the Craw-Kan Telephone Cooperative Association, Inc., about  $2\frac{1}{2}$  miles of unarmored No. 14 gauge copperweld wire in a single extrusion of polyethylene (Bell System "C" wire);  $2\frac{1}{2}$  miles of unarmored No. 17 gauge

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hard-drawn copper wire, with a single extrusion of polyethylene on each wire and an outer jacket of vinyl; 5 miles of No. 14 gauge copperweld wire in a single extrusion of polyethylene, outer jacket of vinyl; and 5 miles of armored No. 17 gauge hard-drawn copper wire with a single extrusion of polyethylene on each wire with a 5 mil bronze shield applied longitudinally over those and an outer jacket of vinyl. All are two conductor type. REA also provided the detailed instructions for the installation. All of the splices and terminations are above ground on posts. The installation was made the second week of October and observed by several REA representatives. A memorandum is to be issued giving more details about the project.

### Demonstration of Wire Chief's Set for Subscriber Line Trouble Testing

Staff Engineering has built a demonstration set which permits demonstrating trouble tests on subscriber's lines and stations. It is in two portable cabinets designed primarily for demonstrations before small groups who can observe the voltmeter tests commonly provided for in community dial line test equipment. A screen and slide projector is used as an adjunct to show the circuit conditions used in tests for various kinds of trouble. It has been shown to groups of borrowers' personnel at Portland, Oregon; Hutchinson, Kansas; and will be shown to a South Dakota group in December. It is available on a limited basis for training and demonstration purposes before regular borrower meetings.

### Noise Problem Demonstration Set

A demonstration set has been built by Staff Engineering which simulates the causes and effects of noise interference on telephone circuits. The set comprises seven portable units which can be set up in a conference room for demonstration to interested groups. A loud speaker amplifies the noise to make it audible to the audience. The staff engineers of the Telephone Engineering Division in Washington, D.C., have been given a demonstration. It was used at a meeting of REA borrowers at Hutchinson, Kansas, November 7 and 8, 1956, and it is expected that similar use will be made of the set at other meetings in the field from time to time.

### Virginia and Florida Systems Selected for Dial Mobile Radio Tests

The dial mobile equipment which is being developed for REA by Motorola Inc., is to be installed and tested at Amherst, Virginia, in the system of the Central Virginia Telephone Corporation. This equipment will include two mobile units, one base station and one fixed subscriber station.

Similar equipment being developed by the Automatic Electric Company will be installed at Live Oak, Florida, in the system of the North Florida Telephone Company.

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#### Federal Communications Commission Action on Mobile Radio for Construction and Maintenance Withdrawn

On September 19, 1956, the Federal Communications Commission (FCC) issued a Report and Order which would make telephone companies eligible in the Power Radio Service to operate radio equipment for their private use for communicating with their construction and maintenance vehicles. Only three pairs of frequencies in the 450 - 460 mc band were made available for this purpose. However it was expected that other frequencies in the 30 - 50 mc and 152 - 162 mc bands would be made available at a later date.

Because many of the present utility users in the Power Radio Service objected to having the telephone companies using frequencies presently allocated to them, the FCC on October 26 issued an order staying the Report and Order of September 19; i.e., no licenses would be granted to the telephone companies until after the FCC made further study of the matter.

Under the present FCC Rules (Part 21, Section 21.511(b)) telephone companies are authorized to install two-way radio equipment in their vehicles for the purpose of providing communication for their own use incident to construction and maintenance of public communication facilities. It is provided, however, that the use of the authorized facilities on such frequencies shall be on a secondary basis and subject to use by public subscribers at any time when required for the rendition of public communication service.

#### Two-Way Mobile Users Among REA Borrowers

The following borrowers have installed or are in the process of installing two-way mobile radio in their vehicles for use in the construction and maintenance of their communication facilities:

Alabama	506
Florida	509
Georgia	544
Illinois	525
Kansas	531
Louisiana	506
Montana	525
North Dakota	525
North Dakota	520
South Carolina	518
Texas	517
Virginia	515
Virginia	502

#### Microwave Radio is Gaining in Use by REA Borrowers

Because of the advantages offered by radio over wire lines particularly where 8 or more circuits are involved over distances greater than 15 to 20 miles, there is a great deal of interest in microwave radio.



If the Cook No. 3800 or Automatic Electric Co. No. 675 and No. 676 types of MDF are used, this can be accomplished by removing the carbon block during the test. An alarm will be indicated while the block is out, unless a dummy block is inserted, but this should not interfere with the results of the test.

With other types of main distributing frames, it is recommended that carbon blocks be replaced with dummy blocks during the test.

TE & CM Section 680, Outside Plant Acceptance Tests, and other REA publications will be revised to reflect these precautions.

#### Stapling Guns and Staples

Trouble has been experienced because of use by station installers of improperly shaped wiring staples and staples made of corrodible material, as well as damage to station wire insulation from driving staples with too much force. The pending rewrite of Section 701, Station Installation, will include some precautionary material regarding the use of wiring staples driven by tackhammer or stapling gun. In the meantime future trouble may be prevented if field engineers will discuss with borrowers, engineers and contractors the use of staples and stapling guns. The proper shape of staple can be readily determined by matching the staple with the wire. The choice of staple material definitely points to non-corrosive material for both inside and outside use. Adjustment of the stapling gun, of course, must vary with the type of material to which the wire is stapled.

#### Prelashed Ties on Tandem Brackets, Point Brackets and Double Arms

In some situations insulators are so close together that the splint ends interfere due to their length. In other situations the ends will not intertwine because the direction of spiral is different on the two ends. These situations include ties at tandem brackets, point type brackets, double arms, and where two wood brackets are used on each wire as in the PAL-3 Unit. Railroad crossing specifications require tying line wires at both crossarms (double arms required). This makes it necessary to tie a line wire to both insulators on a tandem bracket on a railroad crossing pole. Although in some of these situations the prelashed splint ends will intertwine satisfactorily as on 12 inch point brackets, the cases are numerous where the ends are too long or will not intertwine due to the spiraling being different on the two ends of a prelashed splint. Consequently, it is suggested that splint ends be cut off to prevent overlap or intertwining at all places where they are placed on adjacent insulators on a wire on tandem brackets, double arms, point brackets and double wood brackets.

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Proposed Revision of the Telephone System Construction Contract, REA  
Form 511

REA Form 511 is to be revised and the draft must be in the hands of the printer by February 1, 1957. If anyone has a proposed correction or revision it should be submitted promptly in order to be considered.